## Lightweight Deployable Power Generator

A Collaborative Effort between the US Air Force Research Laboratory and Private Industry

## THE PROBLEM:

Current Bare Base generators are large, heavy and built based on 1960s technology. They account for more than five percent of the initial and follow-on deployment sorties. Rapid deployment of Air Force resources demands the development of compact, lightweight equipment.



**Current Bare Base Generators** 

## THE SOLUTION:

The Air Force Research Laboratory, Materials and Manufacturing Directorate, Airbase and Environmental Technology Branch (AFRL/MLQC), is developing a lightweight generator. This unit possesses reduced weight and volume, improved reliability, enhanced fuel economy, and reduced logistics and operation and maintenance costs.

The lightweight generator design concept is based on a high-speed rotary engine as a prime mover, perma-

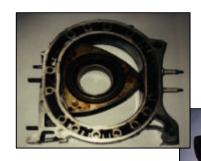
**Generator Architecture** Flow meter 250 V 12 phase 800 Hz Engine Rectifier Generator Electronics Cooling Radiator Engine Cooling System 120/208 Filter 120/208 Main Power VAC Coolant Flow 3 phase Flow meter

nent magnet disk generator for power generation, and state-of-the-art electronic switching devices for power conditioning.

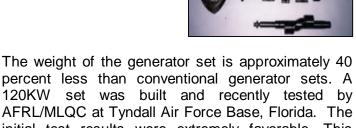
Rotary engine technology was selected because of its compact size, lightweight, and high performance. Rotary engines with multi-fuel capability are available (JP-4, JP-5, JP-8, diesel, gasoline, and kerosene).

The disk generator is very compact and lightweight. When combined with its rectifier and inverter, the disk generator is capable of producing electric power of 50/60/400 Hz frequency without loss of output power.

The control architecture is designed to respond to transient loads without decreases in-line voltage or frequency, and to reduce fuel consumption and engine wear through variable speed operation.



**Rotary Engine** 



percent less than conventional generator sets. A 120KW set was built and recently tested by AFRL/MLQC at Tyndall Air Force Base, Florida. The initial test results were extremely favorable. This technology has the potential to revolutionize Air Force power generation systems.

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120KW Genset